

THE PSYCHOLOGICAL BULLETIN

SPRING SUSPENSION FOR LABORATORY MOTORS.

Small motors of high velocity, such as are used in laboratories in verifying the laws of color-mixing or in driving apparatus, when left free on a table or clamped to it, produce a noise that is troublesome and under some circumstances intolerable. This fact led five or six years ago to a trial of certain remedies, one of which proved thoroughly satisfactory and has been in use here since that time. By this means the reduction of noise is about as great as that effected by holding the motor in the hands, so that a large number of motors may be in use in a room at the same time without disturbing individual concentration or instruction or making a noise that is felt to be disagreeable by the average person.

The device consists of suspending the motor by one or more springs, according to the position and work required.

Fig. 1 represents the mode of suspension for a color-mixer rotating in a vertical plane.

The more extensible the spring the less will the motor be able to communicate vibration to the point of suspension; long, extensible springs have this advantage, but rather short and stiff springs will give results sufficiently good for most purposes. The springs employed have usually been from four to eight inches long and have stretched from two to four inches respectively from the weight of the motor.

The point of suspension may, of course, be anything suitable, such as the arm of a standard, which is convenient if the motor is to be moved about, as may be the case in giving demonstrations before a class; attachment by means of a wire to a hook in the ceiling is also a good way, especially for motors to be used in general laboratory practice.

As the motor hangs free, it can easily be turned and moved in any direction so as to bring the discs into the best light or to the point for most convenient inspection. Rocking or twisting movements of the

motor have not proved troublesome; the motors keep the plane of rotation quite steady, partly no doubt because of the very considerable gyroscopic force developed, the effects of which are easily detected

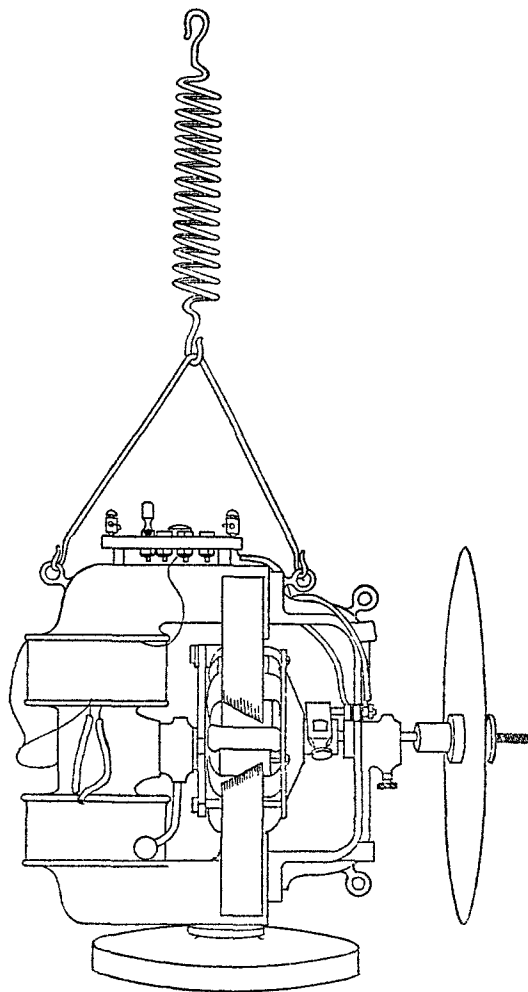


FIG. 1.

when a motor is held in the hands and its plane of rotation is forcibly and suddenly altered.

Motors with heavy armatures keep in motion so long after the current is turned off that the use of a brake is very desirable. It

would be well if motors of this type, when constructed especially for color experiments, were fitted from the start with brakes; if they are not so equipped, a simple form of brake can be made by screwing a short cylinder on in front of the disc holder, to which friction is then applied by means of a U-shaped metal band fitting closely over it.

The measuring and changing of discs is a little more difficult than when the motor is fixed in position; some would perhaps on that account prefer the plan illustrated by Fig. 3, in which the motor is hung by two springs and is in a more stable position. For purposes of color-mixing, if this plan is adopted, it would be better to have the

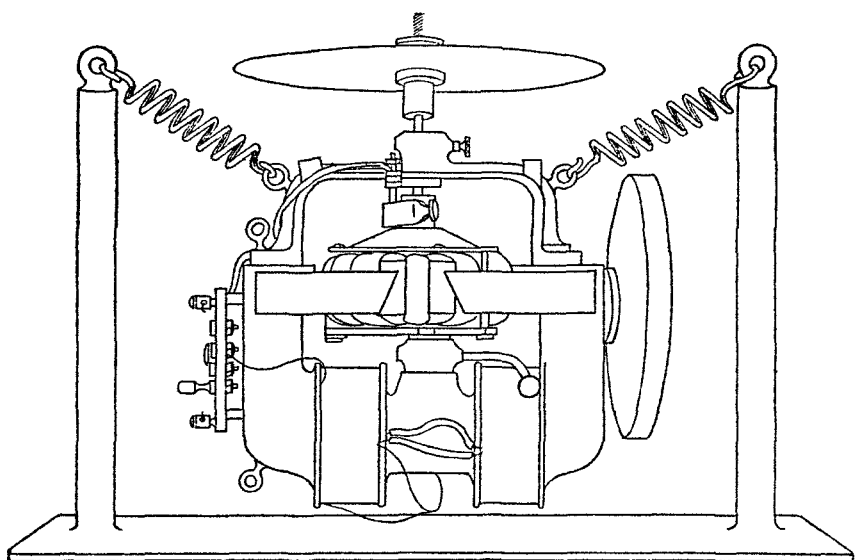


FIG. 2.

clamp part of the fixture turned half way around so as to make the arm project away from the table, especially if the table is broad.

Fig. 2 represents the mode of suspension for rotation in a horizontal plane, such as is necessary, for example, in mapping out the color fields with the aid of the campimeter. The position is stable and in every way convenient for the purpose it serves.

Fig. 3 represents one of the several possible applications of the plan of spring suspension in the case of motors used for running laboratory apparatus. The motor may be placed below or at the sides as well as above, as represented here; while the application of the

plan affords no special difficulties in any position, the position above is perhaps the most generally serviceable.

In any case, the thing important is to have the spring over the belt wheel of the motor a little shorter or stronger than the other, so

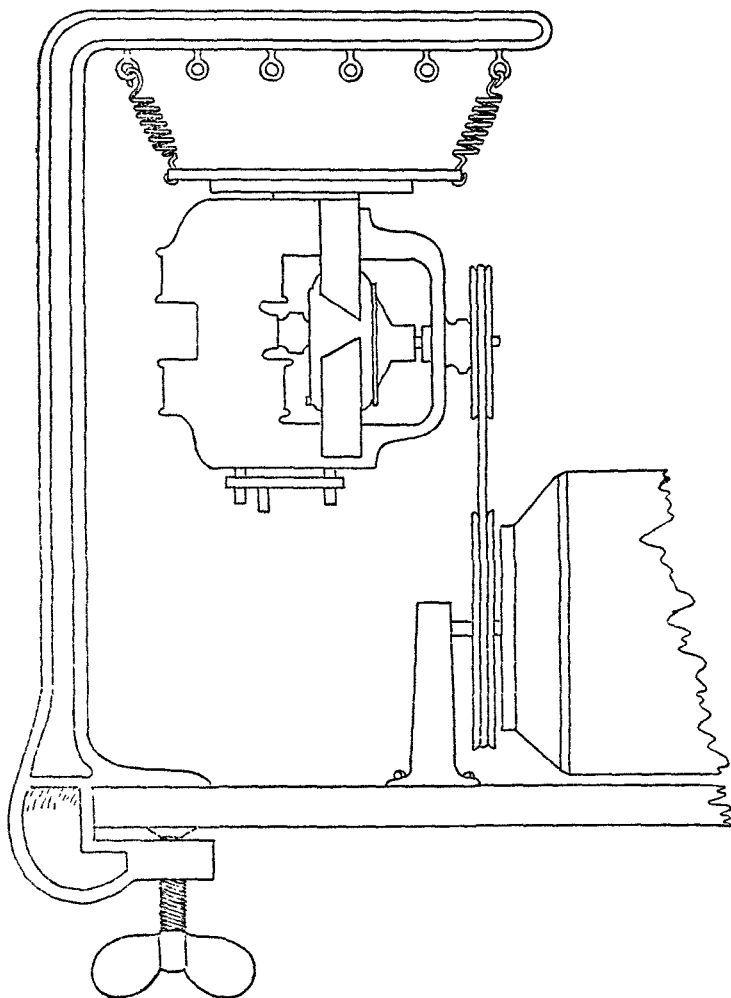


FIG. 3.

that this end of the motor must be pulled down an inch or so to bring the axis of the motor parallel with the axis of the apparatus which it is to run. The belt should be just long enough to keep the motor in this parallel position.

The arrangement does not merely reduce the noise, but, what may be more important in some cases, it largely prevents vibration and keeps the belt, which may be quite short, always tight.

Some reduction in noise and vibration may be secured by giving the motor a spring base; but the base will be comparatively rather stiff, and as good results have not been obtained with this as with the plan of suspension.¹

JOHN A. BERGSTRÖM.

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